

### Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A facilitated transport membrane for separation of alkene hydrocarbons from hydrocarbon mixtures, comprising a porous supported membrane and a solid polymer electrolyte layer consisting essentially of a transition metal salt and a polymer having double carbon bonds, wherein the facilitated transport membrane is operated under dry operating conditions.
2. (Currently amended) The facilitated transport membrane according to Claim 1, wherein a cation of the transition metal salt has ~~[[the]]~~ an electronegativity of 1.8~~~2.3.~~  
~~2.3.3. The facilitated transport membrane according to Claim 2, wherein the transition metal is~~  
~~[[one]] selected from the group consisting of Mn, Fe, Co, Ni, Cu, Mo, Te, Ru, Rh, Pd, Ag,~~  
~~Re, Os, Ir, Pt and complexes thereof.~~
3. (Original) The facilitated transport membrane according to Claim 1, wherein the transition metal salt has a lattice energy of 2500 kJ/mol or less.
4. (Currently amended) The facilitated transport membrane according to Claim 4, wherein an anion of the transition metal salt is ~~[[one]]~~ selected from the group consisting of F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>, CN<sup>-</sup>, NO<sub>3</sub><sup>-</sup>, SCN<sup>-</sup>, ClO<sub>4</sub><sup>-</sup>, CF<sub>3</sub>SO<sub>3</sub><sup>-</sup>, BF<sub>4</sub><sup>-</sup>, AsF<sub>6</sub><sup>-</sup>, PF<sub>6</sub><sup>-</sup>, SbF<sub>6</sub><sup>-</sup>, AlCl<sub>4</sub><sup>-</sup>, N(SO<sub>2</sub>CF<sub>3</sub>)<sub>2</sub><sup>-</sup>, and C(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub><sup>-</sup>.
5. (Original) The facilitated transport membrane according to Claim 1, wherein the transition metal salt includes a complex salt of the transition metal or a mixture of the salts of the transition metal.
6. (Currently amended) The facilitated transport membrane according to Claim 1, wherein the polymer is ~~[[one]]~~ selected from the group consisting of polytrimethylsilylpropyne, polystyrene, poly(tert-butyl)propyne, polyisopropylpropyne, polybutadiene, polyisoprene, polynorbornene, polyhexamethylene vinylene, polypynene, and physical mixtures thereof.
7. (Original) The facilitated transport membrane according to Claim 1, wherein the porous supported membrane is a porous polymer membrane or ceramic membrane used in the

preparation of a conventional composite membrane.

8. (Original) The facilitated transport membrane according to Claim 1, wherein the hydrocarbon mixtures to be separated contain at least one alkene hydrocarbon and at least one alkane hydrocarbon or an inert air.

9. (Currently amended) The facilitated transport membrane according to Claim 9, wherein the alkene hydrocarbon is [[one]] selected from the group consisting of ethylene, propylene, butylene, 1,3-butadiene, isobutylene, and mixtures thereof, the alkane hydrocarbon is [[one]] selected from the group consisting of methane, ethane, propane, butane, isobutene, and mixtures thereof, and the inert air is [[one]] selected from the group consisting of oxygen, nitrogen, carbon dioxide, carbon monoxide, water, and mixtures thereof.

10. (New) The facilitated transport membrane according to Claim 2, wherein the transition metal is selected from the group consisting of Mn, Fe, Co, Ni, Cu, Mo, Tc, Ru, Rh, Pd, Ag, Re, Os, Ir, Pt, and complexes thereof.